NOTICE

HOFFER FLOW CONTROLS, INC. makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

This manual has been provided as an aid in installing, connecting, calibrating, operating, and servicing this unit. Every precaution for accuracy has been taken in the preparation of this manual; however, HOFFER FLOW CONTROLS, INC. neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that may result from the use of the products in accordance with information contained in the manual.

HOFFER FLOW CONTROLS' policy is to provide a user manual for each item supplied. Therefore, all applicable user manuals should be examined before attempting to install or otherwise connect a number of related subsystems.

During installation, care must be taken to select the correct interconnecting wiring drawing. The choice of an incorrect connection drawing may result in damage to the system and/or one of the components.

Please review the complete model number of each item to be connected and locate the appropriate manual(s) and/or drawing(s). Identify all model numbers exactly before making any connections. A number of options and accessories may be added to the main instrument, which are not shown on the basic user wiring. Consult the appropriate option or accessory user manual before connecting it to the system. In many cases, a system wiring drawing is available and may be requested from HOFFER FLOW CONTROLS.

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HOFFER FLOW CONTROLS’ policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering. The information contained in this document is subject to change without notice.

Return Requests / Inquiries

Direct all warranty and repair requests/inquiries to the Hoffer Flow Controls Customer Service Department, telephone number (252) 331-1997 or 1-800-628-4584. BEFORE RETURNING ANY PRODUCT(S) TO HOFFER FLOW CONTROLS, PURCHASER MUST OBTAIN A RETURNED MATERIAL AUTHORIZATION (RMA) NUMBER FROM HOFFER FLOW CONTROLS' CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned RMA number should then be marked on the outside of the return package and on any correspondence.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting HOFFER FLOW CONTROLS:
1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS OR CALIBRATIONS, consult HOFFER FLOW CONTROLS for current repair/calibration charges. Have the following information available BEFORE contacting HOFFER FLOW CONTROLS:
1. P.O. number to cover the COST of the repair/calibration,
2. Model and serial number of the product and
3. Repair instructions and/or specific problems relative to the product.
LIMITED WARRANTY

HOFFER FLOW CONTROLS, INC. ("HFC") warrants HFC's products ("goods") described in the specifications incorporated in this manual to be free from defects in material and workmanship under normal use and service, but only if such goods have been properly selected for the service intended, properly installed and properly operated and maintained. This warranty shall extend for a period of one (1) year from the date of delivery to the original purchaser (or eighteen (18) months if the delivery to the original purchaser occurred outside the continental United States). This warranty is extended only to the original purchaser ("Purchaser"). Purchaser's sole and exclusive remedy is the repair and/or replacement of nonconforming goods as provided in the following paragraphs.

In the event Purchaser believes the goods are defective, the goods must be returned to HFC, transportation prepaid by Purchaser, within twelve (12) months after delivery of goods (or eighteen (18) months for goods delivered outside the continental United States) for inspection by HFC. If HFC's inspection determines that the workmanship or materials are defective, the goods will be either repaired or replaced, at HFC's sole determination, free of additional charge, and the goods will be returned, transportation paid by HFC, using the lowest cost transportation available.

Prior to returning the goods to HFC, Purchaser must obtain a Returned Material Authorization (RMA) Number from HFC's Customer Service Department within 30 days after discovery of a purported breach of warranty, but no later than the warranty period; otherwise, such claims shall be deemed waived. See the Return Requests/Inquiries Section of this manual.

If HFC's inspection reveals the goods are free of defects in material and workmanship or such inspection reveals the goods were improperly used, improperly installed, and/or improperly selected for service intended, HFC will notify the purchaser, the purchaser will deliver the goods back to Purchaser upon (i) receipt of Purchaser's written instructions and (ii) the cost of transportation. If Purchaser does not respond within thirty (30) days after notice from HFC, the goods will be disposed of in HFC's discretion.

HFC does not warrant these goods to meet the requirements of any safety code of any state, municipality, or other jurisdiction, and Purchaser assumes all risk and liability whatsoever resulting from the use thereof, whether used singly or in combination with other machines or apparatus.

This warranty shall not apply to any HFC goods or parts thereof, which have been repaired outside HFC's factory or altered in any way, or have been subject to misuse, negligence, or accident, or have not been operated in accordance with HFC's printed instructions or have been operated under conditions more severe than, or otherwise exceeding, those set forth in the specifications for such goods.

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Drawing:
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Additional Drawings
1. OUTLINE

The Hoffer ACE P8 is a line thermal paper printer for use with ACE II and ACE-B cryogenic flow computers. It is a compact lightweight printer with RS232 interface, can be used in a variety of commercial and industrial applications in which small size without compromising performance and reliability.

1-1 FEATURES

1. Point of sale printed delivery ticket.

2. Customize delivery tickets (contact factory).

3. Reproduction of lost or damaged delivery ticket prior to the start of next delivery.

4. Maintenance reports for calibration and malfunction history.

5. Preventive maintenance schedule and recalibration date printing on daily trip report.


7. Self test to check control circuit function, printer mechanism and printing quality.

8. Shock mounted waterproof NEMA 4X enclosure.

9. Optional heaters for operation below 32 deg F.
1-2  SPECIFICATIONS

Printer Characteristics:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printing Method</td>
<td>Line Thermal Printing</td>
</tr>
<tr>
<td>No. of columns</td>
<td>42, 24</td>
</tr>
<tr>
<td>Dot Density</td>
<td>8 dots/mm (203 dpi)</td>
</tr>
<tr>
<td>Print Speed</td>
<td>2 inches/sec</td>
</tr>
<tr>
<td>Print Width</td>
<td>48.8mm, 384 dots</td>
</tr>
<tr>
<td>Characters per Line</td>
<td>Font A: 32 characters/line</td>
</tr>
<tr>
<td></td>
<td>Font B: 42 characters/line</td>
</tr>
<tr>
<td>Recommended Paper</td>
<td>58mm +/- x 2.25 inch diameter</td>
</tr>
<tr>
<td></td>
<td>Roll thermal paper (TP58)</td>
</tr>
<tr>
<td>Interfaces</td>
<td>IRS-232C</td>
</tr>
<tr>
<td>Power</td>
<td>12, 24 VDC</td>
</tr>
<tr>
<td>Dimension</td>
<td>7.7”x7.7”x7.0”</td>
</tr>
</tbody>
</table>

Environmental (without heaters)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>0º to 50º C (ambient)</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>35% to 85%, non-condensing</td>
</tr>
</tbody>
</table>

Reliability

|                                | MCBF 50 million pulses               |
|                                | Print head 50 km of paper             |
The printer is mounted in a fiberglass water-proof enclosure that meets Nema 4X and is supplied complete with shock mounts. The enclosure needs to mount in a semi-protected area from melting frosted pipes.

### Power Options
- (12) 12 VDC Power Input.
- (24) 24 VDC Power Input.
- (115/220) 115/220 A/C Voltage Input (includes A/C power cable).

### Heaters
- (H) Heater – Required when temperature falls below 32 Deg.F.

### Enclosures
- (M) The printer is mounted in a fiberglass water-proof enclosure that meets Nema 4X and is supplied complete with shock mounts. The enclosure needs to mount in a semi-protected area from melting frosted pipes.

### Special Features
- (SP) Any special features that are not covered in the model number use a written description of the –SP.
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2. **OPERATION**

2-1 Opening/Closing of Printer Cover.

- To open, position your fingers on both sides of the printer as shown in the picture and push the cover up.
- To close, make sure the paper is straight and press on the cover.

2-2 Installing Paper

Please ensure that correct paper is used with the ACE P8 (Media: TP58-98; Width: 58mm; Diameter: 2.25”).

- Open the cover and remove the old paper core.
- Drop the new paper roll into the paper compartment with the emulsion side down, against the printer head.
- Hold the front edge of the paper outside the printer and close the cover.

2-3 Printing

- Make sure printer is on line.
- Press FEED button. If paper advances printer is off-line.
- Press ONLINE button to put printer on line.

**Note:** There is no visual online indicator. Printer switches between online and offline mode when the ONLINE button is pressed.
3. DIAGNOSTICS AND SET UP

3-1 Self-Test

The self-test checks the following:
- Control circuit functions
- Control ROM version
- Program setting
- Printer quality

Running the self-test:
- Make sure the paper is installed correctly and paper cover is closed.
- Turn on the power, while pressing FEED button.
- Setup is printed, followed by a string of test characters (about 92 lines).

3-2 Set-up mode

Follow these steps to change printer settings:
- Turn on the power while pressing the ONLINE button, the printer will go into set-up mode and print the current parameter status.
- The power LED indicator will flash every second to indicate setup mode.
- Each time the ONLINE button is pressed and released the next printer parameter is printed. Pressing the FEED button will cause the status of that parameter to change.
- Once the corrected status has been selected, press ONLINE button while pressing the FEED button.
**Note:** If no buttons are pressed for 15 seconds, the set-up mode is automatically terminated without changing the original parameters.

Factory Default Settings:

- Baud Rate: 9600
- Parity: None
- Handshaking: XON/XOFF
- Print Mode: Text (upright)
- Country: U.S.A
- Paper: Normal paper
- Density: 100%

3-3 Dump mode

The purpose of dump mode is to check whether the printer is receiving the data correctly from host.

Running the dump mode:

- Turn off power
- Turn on the power while pressing SEL and FEED buttons simultaneously
DRAWING
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ACE-P8 Internal Wiring with Optional Heater

<table>
<thead>
<tr>
<th></th>
<th>12V</th>
<th>24V</th>
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<tbody>
<tr>
<td>H1</td>
<td>25 OHM</td>
<td>100 OHM</td>
</tr>
<tr>
<td>H2</td>
<td>100-</td>
<td>100-</td>
</tr>
<tr>
<td>THERMOSTA</td>
<td>100-</td>
<td>100-</td>
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</tbody>
</table>
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ADDITIONAL DRAWINGS
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NOTES:
1. SPECIFY CABLE LENGTH WHEN ORDERING.
2. USE CAROL P/N C2687 CABLE (STOCK # 100-1936) OR EQUIVALENT.
3. BOND SHEILD TO CONNECTOR CABLE CLAMP.

SCA-XCU3-P

X DESIGNATES LENGTH
NOTE 1

NOTE 2

MS3105F-10SL-3S (STOCK # 100-0798)

RED
BLK
WHT

TO ACE/PRINTER

CHASSIS

NOTE 3 /77

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>DRAWN</th>
<th>DATE</th>
<th>SWEET</th>
<th>CHEK</th>
<th>ENG</th>
<th>KEPKA</th>
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<tbody>
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</tbody>
</table>

NOTE 2

FINISH

CABLE, POWER
ACE/PRINTER

REFERENCE

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NEXT ASSY USED ON APPLICATION
NOTES:
1. SPECIFY CABLE LENGTH WHEN ORDERING.
2. USE MANHATTEN P/N M5423 CABLE OR EQUAL.
3. BOND SHIELD TO CONNECTOR CABLE CLAMP.

CABLE PART NUMBER:
SCA-XCC3-P
X DESIGNATES LENGTH
(NOTE 1)

REV
DESCRIPTION
DATE
APP
A ADDED NOTE 3 AND SHIELD. (CS) 941213 J0
B NOTE 3 P/N WAS M33573. (CS) 950102 J0
C PER ECP 540, DWG NO WAS 100-2026 080211 Y.K.
D PER ECP 561, REMOVED SHIELD FROM PRINTER END OF CABLE 091120 JJ

REPLACES 100-2026

MATERIAL COST
NOTE 2 DRAWN SWEET DATE 940903
CHECK 940903
FINISH QA
PROJ ENG

CONFIDENTIAL PROPERTY OF HOFFER. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS.

NEXT ASSY USED ON APPLICATION

H HOFFER FLOW CONTROLS, INC.
ELIZABETH CITY, NC 27909

H POWER CABLE, PRINTER TO ACE-OMIL

SIZE CAGE CODE DWG NO REV
A33321 SCA-915 D

SCALE NONE SHEET 1 OF 1

HP-314 16 AE-P8 Printer
NOTES:
1. SPECIFY CABLE LENGTH WHEN ORDERING.
2. USE WIRE TYPE CAROL P/N C078-21-10 OR EQUIVALENT.
3. BOND SHIELD TO CONNECTOR CABLE CLAMP.

SCA-X-CC4-RS232
X DESIGNATES LENGTH
NOTE 1

MS3106F-14S-6P
NOTE 2
MS3106F-14S-6P

TO PRINTER

TO ACE

NOTE 3

H OFFER FLOW CONTROLS, INC.
ELIZABETH CITY, NC 27909

CABLE, ACE/PRINTER SYSTEM
NOTES:
1. SPECIFY CABLE LENGTH WHEN ORDERING.
2. USE ALPHA P/N 5362 CABLE OR EQUIVALENT.
3. BOND SHIELD TO CONNECTOR CABLE CLAMP.

SCA-XCU2-P

X DESIGNATES LENGTH
NOTE 1

NOTE 2

MS3106F-10SL-3S

TO ACE/PRINTER

REPLACES 700-0066

HOFFER FLOW CONTROLS, INC.
ELIZABETH CITY, NC 27909

CABLE, POWER ACE/PRINTER

<table>
<thead>
<tr>
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<tr>
<td>NOTE 2</td>
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<tr>
<td>DRAWN</td>
<td>SWEET</td>
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<tr>
<td>CHECK</td>
<td>JAS</td>
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<tr>
<td>FINISH</td>
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</tr>
<tr>
<td>QA</td>
<td>H. COVELL</td>
</tr>
<tr>
<td>PROJ. ENG</td>
<td>K. HOFFER</td>
</tr>
<tr>
<td>DATE</td>
<td>8/20/14</td>
</tr>
<tr>
<td>DATE</td>
<td>8/20/14</td>
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2 PLACE DECIMAL ± .01
2 PLACE FRACTIONAL ± 1/64
ANGULAR ± 1/22

A33321 SCA-920 D

SCALE
NONE
SHEET 1 OF 1